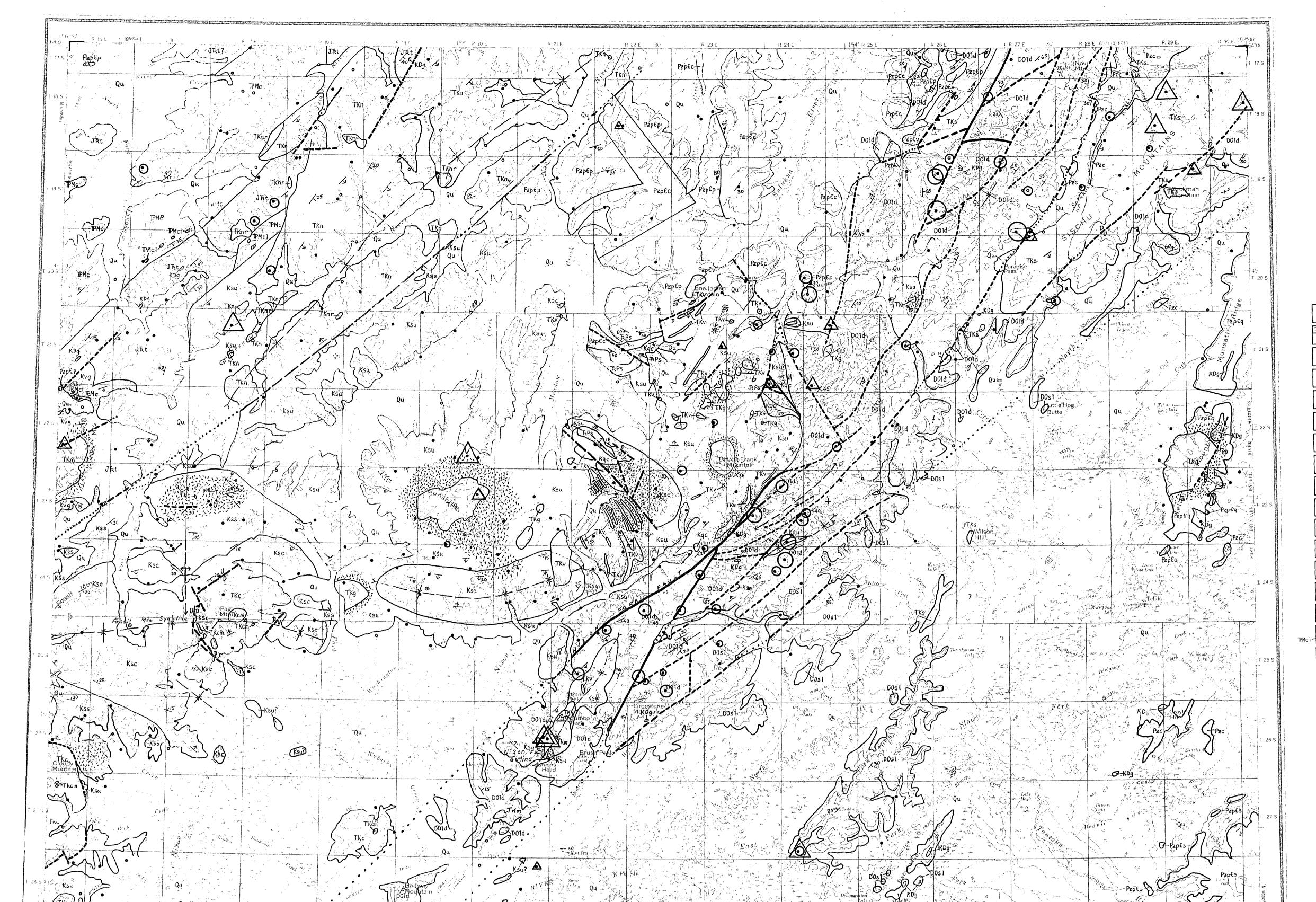
SHEET 1 OF 4

GEOLOGIC SYMBOLS



1959 M/GNETC OF COMATION CONTENTS OF SHORES FROM 2 FOR IC 84 38 EAST MOLYBDENUM IN NONMAGNETIC AND MODERATELY MAGNETIC HEAVY-MINERAL-CONCENTRATE SAMPLES

10 19 20 29 MILES

CONTOUR INTERVAL 200 FEET DOTTED LINE'S REPRESENT TOO TO IT CONTOURS

5 10 15 20 25 KILOMETERS

Base from U.S. Geological Survey, 1959

Introduction These geochemical maps show some results of a reconnaissance geochemical survey done in the Medfra quadrangle, Alaska in 1978 and 1979 as part of the Alaska Mineral Resource Assessment Program. The maps show the distribution and abundance of molybdenum, tin, and tungsten in 370 nonmagnetic (C3 fraction) and 422 moderately magnetic (C2 fraction) heavy-mineralconcentrate samples, and tin in 513 minus-80-mesh stream-sediment samples, and in 355 ash of aquaticbryophyte (moss) samples on a subdued topographic and generalized geologic base. The maps of this report are presented largely to aid users in making their own interpretations. Additional individual element plots for selected elements are available in King and

Triangles and circles in different sizes are used to represent values and ranges of values as defined in the histograms (figures 1-4). Triangles denote molybdenum, tin, and tungsten in the C3 fraction and tin in mosses. Circles denote molybdenum, tin, and tungsten in the C2 fraction and tin in sediment samples. The largest symbols indicate the highest

Symbols used to indicate sample sites and also to denote what types of samples were collected at the sites are small dots, circles, and crosses. Explanations for these symbols are given with each

The maps show all detected values for molybdenum and tungsten in the C3 and C2 fractions and all detected values for tin in the C2 fraction, sediment, and moss samples. A plot showing all tin values in C3 fractions was examined and low concentration values with high frequencies showing widespread distribution and little apparent evidence of patterns interpreted as meaningful with respect to geochemical anomalies were excluded in preparing the map of this report. Tungsten was not detected in sediment or moss samples. Molybdenum was not detected in moss samples and was detected in only a small number of sediment samples, with all values less than the lower limit of

SAMPLING, PREPARATION, AND ANALYSIS OF SAMPLES Most of the samples were taken from channels of active streams with upstream catchment areas averaging about nine km². Samples were taken from first or second order streams whenever possible. Larger, or landing sites along first or second order tributary streams were not available. Minus-2-mm stream sediment was collected for the stream-sediment samples by wet sieving at the sample sites with a stainlesssteel screen. Heavy-mineral-concentrate samples were collected by panning the minus-2-mm stream sediment to remove most of the light-mineral fraction. Samples of aquatic bryophytes were collected from stream channels beneath the water level mainly from

the silty sides of the stream channels but also from

deadwood and boulders where they were attached.

Samples were partially washed in the stream at the sample sites to remove large quantities of silt and sand. No attempt was made to differentiate the various species of bryophytes that were collected. All samples were partially dried in the field and later completely dried in an oven at the laboratory.

After drying, the stream-sediment samples were sieved with an 80-mesh (0.177 mm) screen and the <80-mesh fraction was pulverized to minus 150 mesh in a vertical grinder using ceramic grinding plates. Panned samples were sieved with a 20-mesh (0.8 mm) screen. The <20-mesh fraction was passed through bromoform (specific gravity, 2.86) to remove lightmineral grains not removed in the panning process. Each heavy-mineral concentrate sample was then divided into three fractions based on the magnetic susceptibilities of the mineral grains. A fraction consisting chiefly of magnetite was removed with the use of a hand magnet and a Frantz Isodynamic magnetic separator. Two additional fractions were obtained by passing the remaining sample through the Frantz separator at a setting of 0.6 ampere. The fraction composed of mineral grains having no magnetic susceptibility to 0.6 ampere is referred to in this report as the nonmagnetic fraction. The mineralogic composition of the nonmagnetic fraction was determined by visual observation with a binocular microscope. The fraction consisting of mineral grains with

magnetic susceptibilities between 0.1 and 0.6 ampere

magnetic fraction. Using a microsplitter, a split of

each sample of the nonmagnetic and moderately magnetic

is referred to in this report as the moderately

fractions was obtained. One split was then pulverized to <150 mesh by hand grinding in a mortar and pestle.

The ground portion was used for spectrographic After oven drying the samples of aquatic bryophytes, most remaining silt and sand was removed by hand and compressed air, followed by several rinses with tap water. The samples were again oven dried, pulverized in a blender, and ashed in a muffle furnace during a 24-hour period with a maximum temperature of The ash was passed through a 0.119 mm sieve (145 mesh) to remove most remaining sand grains. The ash of the samples ranged from 8 to 72 percent with a mean weight of 36 percent of the dry material. The ash of aquatic bryophytes that are free of sediment should be approximately 10 percent of the original dry weight (Brooks, 1972, p. 178). Thus, most samples contained various undetermined amounts of sediment. Minus-80-mesh stream sediment samples and the nonmagnetic and moderately magnetic heavy-mineralconcentrate samples were analyzed semiguantitatively for 31 elements using a six-step emission spectrographic method outlined by Grimes and Marranzino (1968). The method was modified slightly

for the concentrate samples to eliminate spectral

interferences. Ash of aquatic-bryophyte samples was analyzed for 33 elements by a semiquantitative

described by Mosier (1972) and modified by Curry and

emission spectrographic method for plant materials

others (1975). All of the analytical results are

available in King and others, (1980).

References cited Brooks, R. R., 1972, Geobotany and biogeochemistry in mineral exploration: New York, Harper and Row, Curry, K. J., Cooley, E. F., and Dietrich, J. A.,

1975, An automatic filter positioner device for emission spectroscopy: Applied Spectroscopy, v. 29, no. 3, p. 274-275. Grimes, D. J., and Marranzino, A. P., 1968, Directcurrent arc and alternating-current spark emission spectrographic field methods for the semiquantitative analysis of geologic materials: U.S. Geological Survey Circular 591, 6 p. King, H. D., Risoli, D. A., Cooley, E. F., O'Leary, R. M., Speckman, W. A., Spiesman, D. L., Jr., and Galland, D. W., 1980, Final results and statistical summary of analyses of geochemical samples from the Medfra quadrangle, Alaska: U.S.

King, H. D., Cooley, E. F., Gruzensky, A. L., and Spiesman, D. L., Jr., 1983a, Distribution and abundance of gold and silver in nonmagnetic and moderately magnetic heavy-mineral-concentrate and minus-80-mesh stream-sediment samples and silver in ash of aquatic bryophyte samples, Medfra quadrangle, Alaska: U.S. Geological Survey Open-File Report 80-811H.

Geological Survey Open-File Report 80-811F,

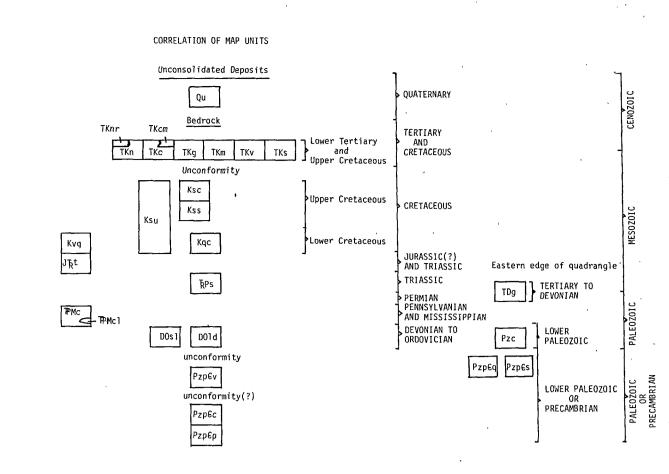
King, H. D., Tripp, R. B., O'Leary, R. M., and Cooley, E. F., 1983b, Distribution and abundance of copper, lead, and zinc in nonmagnetic and moderately magnetic heavy-mineral-concentrate, minus-80-mesh stream-sediment, and ash of aquatic-bryophyte samples, Medfra quadrangle, Alaska: U.S. Geological Survey Open-File Report

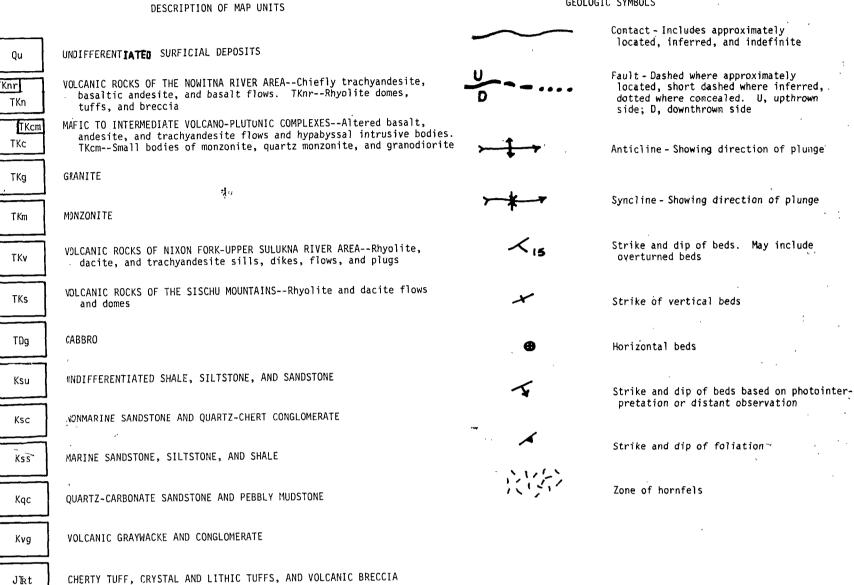
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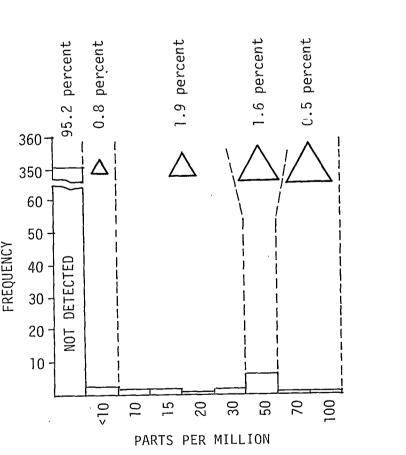
Geology generalized from Patton and others, 1980

King, H. D., Cooley, E. F., and Spiesman, D. L., Jr., 1983c, distribution and abundance of arsenic and bismuth in nonmagnetic and moderately magnetic heavy-mineral-concentrate samples and arsenic in minus-80-mesh stream-sediment and ash of aquaticbryophyte samples, Medfra quadrangle, Alaska: U.S. Geological Survey Open-File Report 80-811K. King, H. D., O'Leary, R. M., Risoli, D. A., and Galland, D. W., 1983d, Distribution and abundance of antimony and mercury in minus-80-mesh streamsediment and antimony nonmagnetic and moderately magnetic heavy-mineral-concentrate samples Medfra quadrangle, Alaska: U.S. Geological Survey Open-File Report 80-811L. Mosier, E. L., 1972, A method for semiquantitative spectrographic analysis of plant ash for use in

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards. Any use of trade names is for descriptive purposes only and does not imply endorsement by the biogeochemical and environmental studies: Applied Spectroscopy, v. 26, no. 6, p. 636-641.







Molybdenum in nonmagnetic heavy-mineral-

concentrate samples

Patton, W. W., Jr., Moll, E. F., Dutro, J. T., Jr.,

Preliminary geologic map of the Medfra

Ward, F. N., Nakagawa, H. M., Harms, T. F., and

Silberman, M. L., and Chapman, R. M., 1980,

File Report 80-811A, 1 sheet, scale 1:250,000.

of analysis useful in geochemical exploration:

U.S. Geological Survey Bulletin 1289, 45 p.

quadrangle, Alaska: U.S. Geological Survey Open-

VanSickle, G. H., 1969, Atomic-absorption methods

SANDSTONE, SANDY LIMESTONE, SPICULITE, AND CONGLOMERATE

CHERT AND LIMESTONE--Chiefly radiolarian chert. TPMcl--Limestone.

TRPs

DOs1

Pzp€c

Pzp€p

SHALY LIMESTONE

LIMESTONE AND DOLOMITE

QUARTZITE, GRIT, AND ARGILLITE

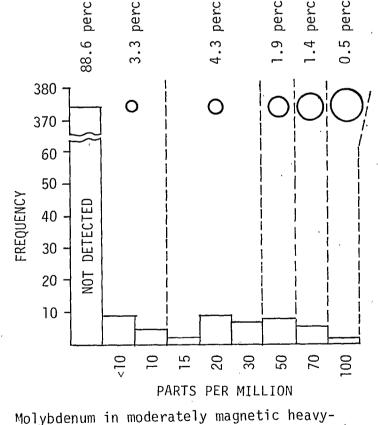
SHEARED GRIT, QUARTZITE, AND QUARTZ-MICA SCHIST

METAVOLCANIC ROCKS--Metarhyolite and dacite

CHERT AND PHYLLITE

CALC-SCHIST

PELITIC SCHIST



mineral-concentrate samples Figure 4.--Histograms for molybdenum in 370 nonmagnetic and in 422 moderately magnetic heavy-mineral-concentrate samples, Medfra quadrangle, Alaska, showing symbols denoting concentrations, and percentage of total number of samples represented by each range.

EXPLANATION OF SAMPLE-SITE SYMBOLS SAMPLE SITES

> Nonmagnetic and moderately magnetic heavy-mineralconcentrate samples

Moderately magnetic heavy-mineral-concentrate samples

+ Nonmagnetic heavy-mineral-concentrate samples

DISTRIBUTION AND ABUNDANCE OF MOLYBDENUM, TIN, AND TUNGSTEN IN NONMAGNETIC AND MODERATELY MAGNETIC HEAVY-MINERAL-CONCENTRATE SAMPLES AND TIN IN MINUS-80-MESH STREAM-SEDIMENT AND ASH OF AQUATIC-BRYOPHYTE SAMPLES, MEDFRA QUADRANGLE, ALASKA